

# What Makes a Good Internet-Draft?

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# Why Us?

- Spencer
  - Currently Transport Area Director
    - Reviews all drafts going for publication as IETF RFCs
  - Long experience of the IETF, IESG, IRTF, and IAB



- Adrian
  - Just appointed as Independent Stream Editor
  - Served six years as Routing Area Director
  - Chaired WGs in Routing, Operations, and Security
- Together have co-authored more than 85 RFCs
- Have reviewed many thousands of Internet-Drafts

# What is the Point?

- Why do you post an I-D?
  - An idea you want the IETF to adopt
  - Something you want published as an RFC
  - Some thoughts you want to share
- What does that imply?
  - You want people to read and understand
  - You want to complete the process
  - You want the publication heads to agree to publish
    - IESG, IRTF, IAB, ISE
  - You want the RFC Editor to be able to publish

# Some Process Steps – for IETF RFCs

- Anyone can post an I-D
  - No checks on quality or content
- You ask people to read and comment
- You ask working group chairs to adopt it
  - There may be a poll in the WG
  - There may be a review team
  - The chairs review it
- The working group “owns” and advances the work
- There is a working group last call
- A shepherd reviews the document and asks for publication
- The AD reviews the document
- There is an IETF last call
  - There will usually be Directorate Reviews
  - IANA reviews for their actions
- The IESG reviews it
- The RFC Editor performs copyedit function





# Copyright and IPR

- Read the boilerplate at the top of the draft carefully before you post it
- *“This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.”*

- All of the authors are committing to disclose any pertinent IPR “in a timely manner”
- It is a **personal** commitment, but consult

your company’s lawyers

- *“Copyright (c) 2018 IETF Trust and the persons identified as the document authors. All rights reserved.”*
  - You are agreeing to share copyright with the IETF
  - You can vary this under exceptional circumstances, but your draft might not be looked on so favourably

# A Philosophy from Coding

- Bugs are more expensive to fix the later they are found
  - Best to fix in design
  - Costly to fix in the field
- The same applies to documentation
  - Additionally, there is emotional baggage with mature documents
- Implication is: Get it right early
  - In particular, don't leave it to the IESG to polish your work
    - Expensive resources (and a bottleneck for the IETF)
    - Late surprises are painful



# Format, Layout, and Ingredients

- The RFC Editor requires specific format and layout
  - You might as well include it from day 1
  - Tools make it easier (<https://www.rfc-editor.org/pubprocess/tools/>)
  - RFC Editor's Style Guide
    - <https://www.rfc-editor.org/styleguide/>
- There's some mandatory stuff
  - All of that boilerplate
    - Get it for free with XML2RFC
    - Copy it from another very recent draft
  - Security Considerations
  - IANA Considerations
- There are some sections strongly recommended
  - Manageability Considerations
- Other sections may be helpful
  - Implementation Status
- Other sections are not needed
  - Morality Considerations (RFC 4041)



# Security Considerations

- This section must be present
  - Don't just write the least you think you can get away with!
  - Think about attacks on and using your protocol
    - Are you using an old protocol in a new way?
    - Are you exposing new information for snooping?
    - What about privacy? Especially “Personal Identifying Information” (“PII”)
    - You want your protocol to be strong and safe
  - Have you used and referenced existing security docs relevant to your protocol?
    - Such as RFC 5920, RFC 6941, and RFC 6952 for MPLS

## Resources

- RFC 3552 (guidelines for security considerations == requirements!)
- RFC 4107 (when do you need to change your keys?)
- RFC 6972 (guidance on privacy)
- Early Security Directorate reviews
- Specific requests for help



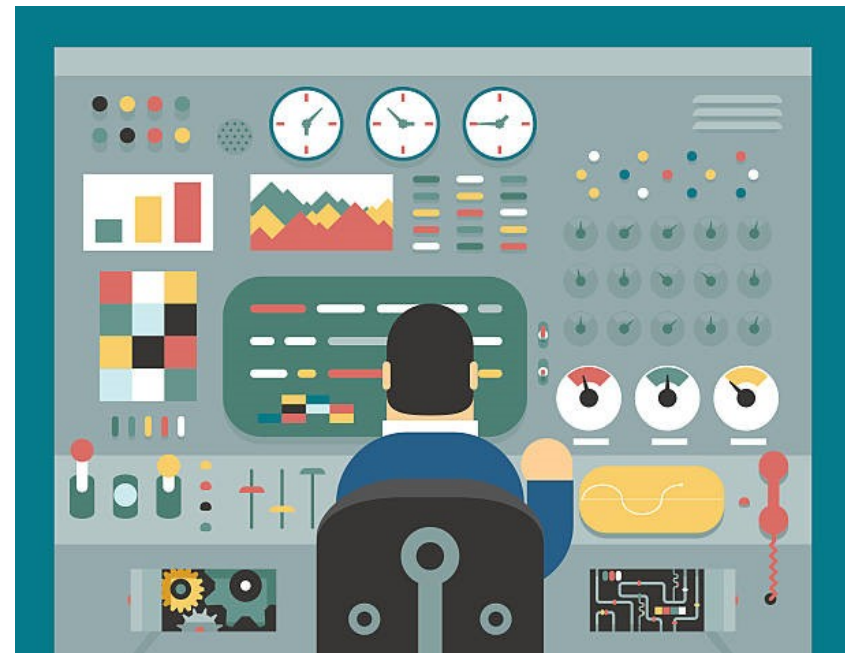


# IANA Considerations

- You cannot make them clear enough!
  - A mistake of interpretation can break your specification
- Which registries?
  - Be very clear by quoting the registry names
- Write down exactly what you want to see in the finished registry
  - Usually best to show a table
- Don't include other stuff in the IANA section
  - We don't need explanations here
  - But we might need “Advice to Designated Experts”
- **DO NOT** use explicit values in the IANA section
  - Unless you are creating the registry or have done early allocation
  - Use tags not values in the text and cross-referenced to the IANA section
    - Disambiguate the tags (e.g., TBD1, TBD2...)
- Resources
  - RFC 8126 (for all IANA Considerations)
  - RFC 3692 (for Experimental code points)
  - Existing registries at <http://www.iana.org/protocols>
  - Ask your WG chair for help

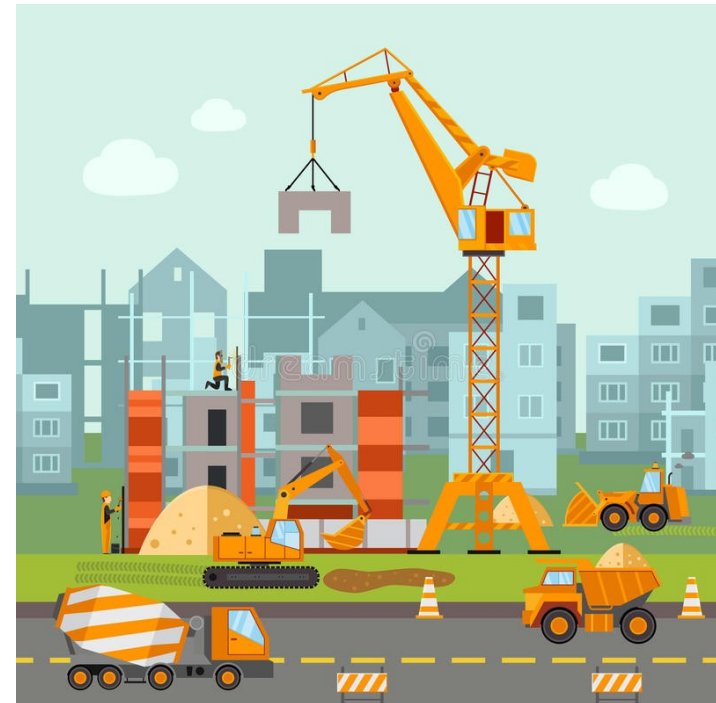
# Manageability Considerations

- Not a requirement, but you need to have thought about manageability
  - So tell the reader what you thought!
  - What to configure, how to manage, how to diagnose, what defaults to set, ...
- Resources
  - RFC 5706 for *guidelines*
  - RFC 6123 for examples
  - Checklists for Ops Directorate reviewers
    - Appendix in RFC 5706
  - Early Ops Directorate reviews
  - Specific requests for help



# Implementation Status

- Some WGs require multiple interoperating implementations before requesting publication
- If no implementation, why do you want an RFC?
- Implementation gives:
  - Validation of technical content
  - Proof that the solution does work
  - Proof of readability and comprehension
  - Firm indication of support and intent
  - A nice warm feeling for the AD
- Resources
  - RFC 7942



# Nits and Gripes

- Have the right reviews been done?
  - Other WGs working on similar topics, same protocols, etc.
  - Experts (YANG, Security, Management)
- Consistent use of RFC 2119/RFC 8174 language
  - Is there a “MAY” for each “SHOULD”/”RECOMMENDED”?
- Are experiments properly described?
- Backwards and forwards compatibility must be described or explicitly ruled out
- Resources
  - I-D Checklist
    - <https://www.ietf.org/standards/ids/checklist/>
  - Some ADs keep a list of things they check for
    - For example from the Routing ADs  
<https://trac.ietf.org/trac/rtg/wiki/RtgADNits>
  - Nit checker
    - <https://www.ietf.org/tools/idnits/>

# Good English is Helpful

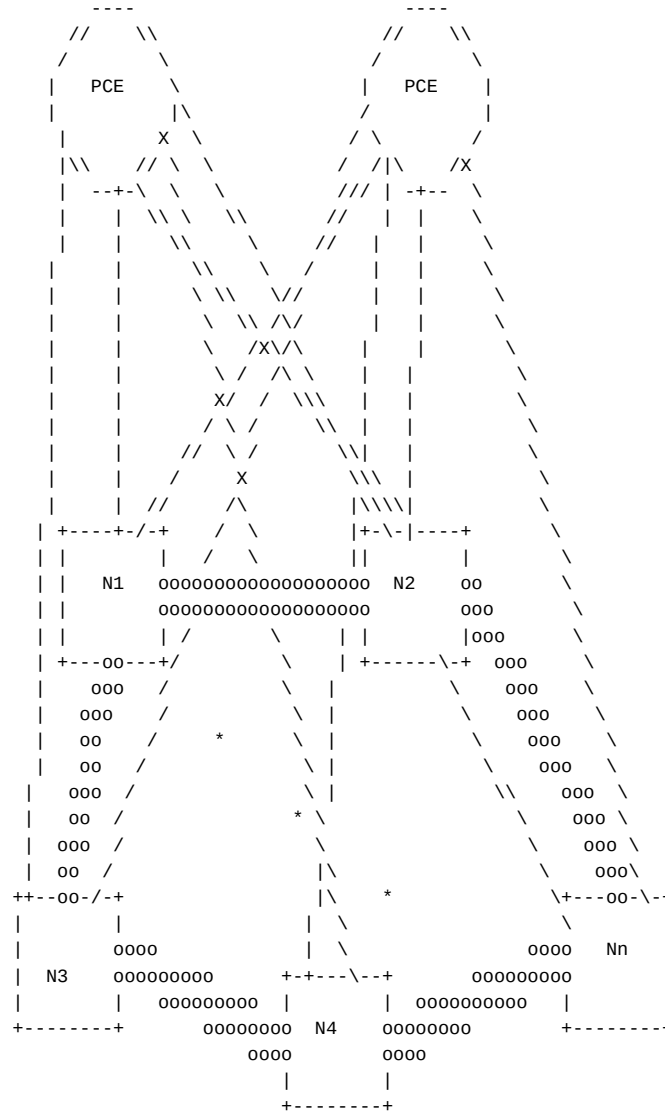
- I know this is not easy
  - Don't ask me to write my I-Ds in Swedish
- But you want your I-D to be as clear and easy to read as possible
- The RFC Editor *will* fix things and ask questions, but...
  - The RFC Editor can only guess at your real meaning
  - Every change risks introducing a technical error
    - Authors assume changes are just a fix in English and don't spot the change in meaning
- Resources
  - Colleagues (that way you keep early versions private)
  - Other people in the WG
    - This is a real chance for newcomers to become involved
  - RFC Editor workshops and tips on I-D writing
    - <https://www6.ietf.org/edu/documents/tutorial76.pdf>
    - <http://trac.tools.ietf.org/group/iesg/trac/wiki/DocumentLanguageEditing>
    - <https://www.rfc-editor.org/styleguide/tips/>
  - idspell <http://tools.ietf.org/tools/idspell/webservice>

# Diagrams

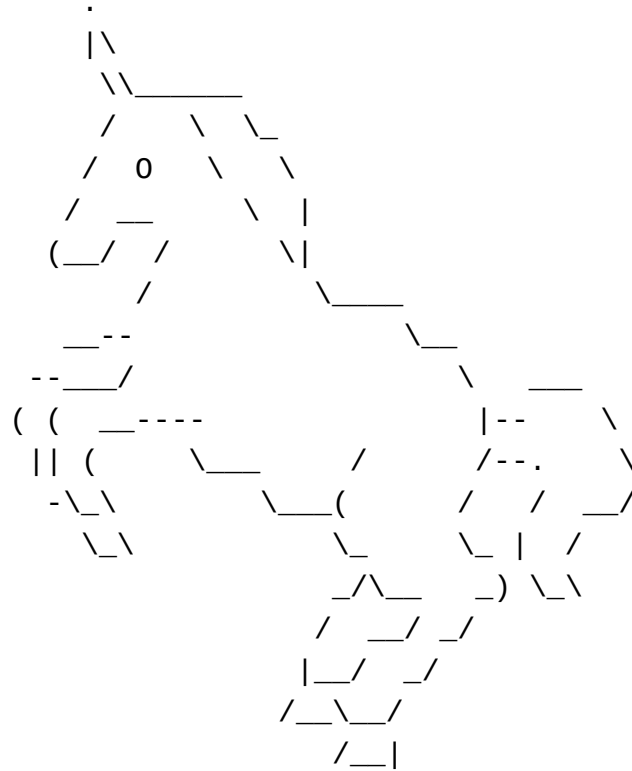
- A picture paints a thousand words
  - But modern art can be hard to decipher
- ASCII art is a skill: some people can do it, and some can't
  - Ask for help
  - Try to avoid drawing circles and clouds: boxes are good
- New rules will allow SVG, but...
  - If you can't show it in 72 character-wide ASCII it might just be too complicated
    - Consider simplifying or breaking up the diagram
- A glimpse of the future
  - <https://www.rfc-editor.org/rse/format-faq/>



# What's Wrong With This?



# But There Can Be Beauty In ASCII Art



From RFC 8140



# Did You Say What You Meant to Say?

- A knowledgeable reviewer (or an author) will parse confusing text sympathetically
  - Could a newcomer read and implement from your spec?
- Issues
  - Sometimes issues of good English
  - Sometimes writing style
    - Avoid complex sentences that save words
    - Use more words and simple sentences
    - Use bullet points
    - Attribute actions – don't use the passive voice
  - You SHOULD consider RFC 2119/8174 language carefully
- Resources
  - Ask for review from the WG / friends / colleagues
  - Some WGs have review teams
  - Ask for early review from your area directorate
  - Working group last call
  - WG chairs
  - WG shepherds



# Could This Be Any Clearer?

## Abstract

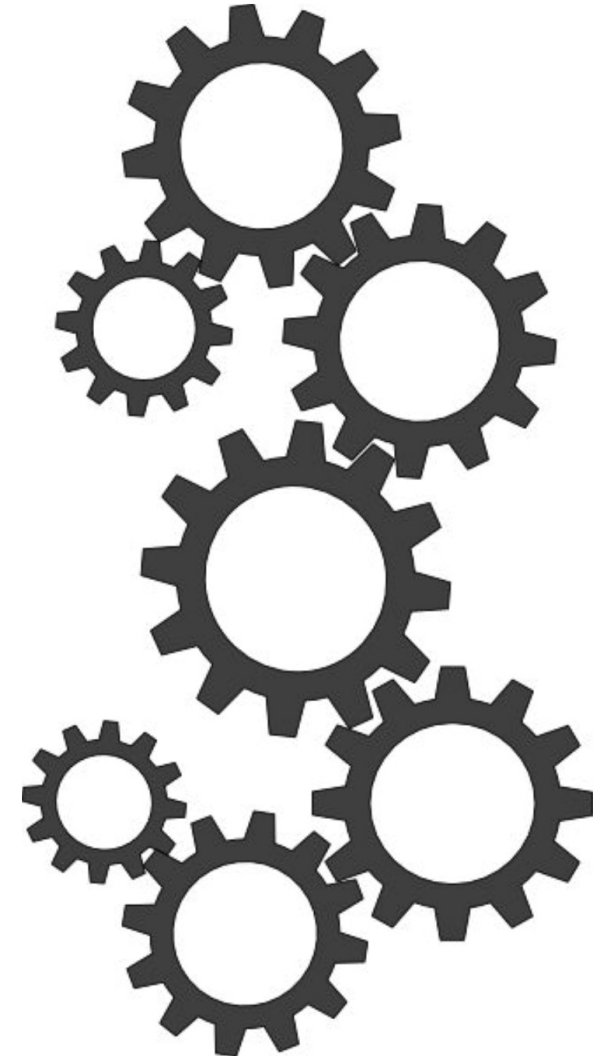
MPLS is the heart and soul of the service provider network. MPLS can carry anydata payload which gives the flexibility to the service provider to provision new service with any expense. The benefit of this technology is core router need not understand the full customer route. If the service a layer 2 then thereis no need of vrf, for customer the service provider cloud is like a virtual switch. The protocol used for label distribution is LDP, BGP,RSVP. The most popular protocol for outer label distribution is LDP. LDP has the benefit of adding more TLV to its payload. In this the possibility of using ldp for generating labels for mac address rather for ip address which gives the benefit to service provider not to run complex routing protocol on core, this does not require ip address. This gives service provider the flexibility to deploy any services, there is no need for changes in network layer when the customer goes for ipv4 to ipv6. This can reduce the CAPEX and OPEX of the customer and reduces the hardware cost too.

# Why Have You Written this Draft?

- This may be the hardest thing to say
  - If you don't know then how will the reader?
- Try to state the problem you are solving
  - Clearly, in a few words, with a picture
  - Say why you are not using existing mechanisms
    - Preferably without being rude or disparaging
- Problem statement != use cases
  - Well sometimes it is, but...
  - Do not just collect a set of sections showing “You could also use my great idea for all these things”
    - That is not why you wrote the draft, it is why someone else might like your idea

# Does the Solution Work?

- It's kind of key, isn't it?
- Getting the main path right is relatively easy
  - While we do not engineer for edge-cases, they have to be covered
- Reviewers should not say “I would not have done it like this”
  - But they will if it is not clear your solution works
  - Your answer can be:
    - We discussed it, but we prefer our approach
- Can interoperable solutions be made?
  - This is the purpose of writing a spec
  - All ambiguity and free choice is bad
  - Have you caught all of the error cases? Can be a catch-all.
  - Options are generally not a good idea



# More Philosophy

- The first version of a draft does not need to be complete
  - In fact, that tends to exclude collaboration
- Do try to get the structure right
  - Put in section headers as place-holders
  - Maybe add some notes saying what might be covered
- But before WG last call, the document should be as complete as the authors can achieve
  - That is, complete!
  - No empty sections
  - No “this will be described in a future revision”

# IETF Stream – your options

- We publish Standards Track, BCP, and Informational RFCs
  - For a protocol, you probably want standards track
  - For a method, you probably want BCP
  - For worthwhile/helpful information, Informational
- We usually publish drafts produced by WGs

- ADs can sponsor drafts, but why not from a WG?
- Working groups have a lot of flexibility, but
  - “Publication Requested” sets off a lot of machinery



# IETF Stream – after the WG

- The formal state machine for publication
  - <https://datatracker.ietf.org/help/state/draft/iesg>
- States you should pay attention to
  - AD Evaluation: you may get feedback from the AD
  - Expert Review: most often for specialties like URN
  - Last Call: you may get feedback from the IETF community (some of this, but not all, from area review)
  - IESG Evaluation: All ADs may comment as part of balloting
  - Approved: take a deep breath
  - RFC Editor Queue: watch for questions from editors

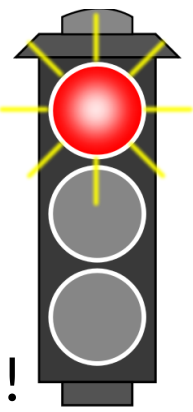


# IETF Stream – Resolving comments

- You may see feedback from
  - Your AD – during AD Evaluation, before the AD requests Last Call
  - The broader IETF community during Last Call
  - Area review teams during Last Call, often before a telechat
  - Other ADs balloting on your document during IESG Evaluation
- Your best strategy: reply to e-mails with comments
  - Your AD will want to know that you saw, and considered, any feedback
  - You don't have to make changes to accommodate every comment
  - Do the right thing
  - Talk to your document shepherd about when to submit updated drafts
- Recent IESGs have taken Comments as seriously as Discusses
  - Please do so as well!



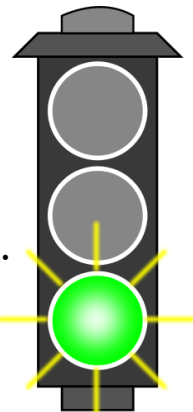
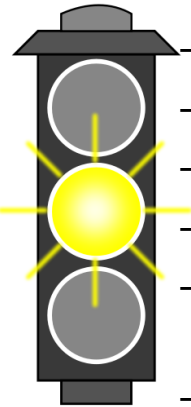
# IETF Stream – Discuss ballots



- Please remember that a Discuss is not a demand for change!
  - Literally, “we should talk”
  - Current Discuss Criteria (and Non-Criteria)
  - <https://www.ietf.org/iesg/statement/discuss-criteria.html>

- Common causes for Discuss Ballots from recent IESGs

- “I can’t understand what’s going on here” – keep non-experts in mind, when you write
- Tutorials aren’t necessary, but summaries and pointers to references can help a lot
- “This reveals Personal Identifiable Information” – keep BCP 188 in mind, when you write
- These days, we consider that IP addresses and prefixes are often tied to a single Person
- “This isn’t safe on the open Internet” because of scaling, security, congestion ...
- We publish a lot of documents that include Applicability Statements. You may need one.
- “Why is this SHOULD not a MUST?” and variations on this RFC 2119/RFC 8174 theme
- More paths through the code can introduce errors and prevent interworking
- You also need to describe what happens when something happens that SHOULDn’t ...



# IRTF Stream

- The IRTF also publishes RFCs in its own stream
  - <https://trac.ietf.org/trac/irtf/wiki/IRTF-RFCs>
  - Note IRTF-specific requirements for content in these drafts!
  - The drafts are usually the product of a Research Group
  - IRTF RFCs aren't Standards Track
    - They are Experimental or Informational
  - No Last Call outside the Research Group before publication
  - Internet Research Steering Group (IRSG) provides review and guidance
  - IESG performs RFC 5742 review for conflicts with IETF standards process, but does NOT approve IRTF-stream drafts

# IAB Stream

- The IAB also publishes RFCs in its own stream
  - Described in RFC 4845
- Often produced by entities that the IAB oversees
  - IAB Programs, RFC Editor, IANA, workshops ...
- IAB-stream RFCs aren't Standards Track
  - Usually Informational
- Process...
  - You will be working closely with at least one IAB member
  - The whole IAB will review your work
  - The IAB will often issue an IETF-wide Call for Comments
    - Not bound to seek consensus or resolve comments
  - The IESG does NOT perform RFC 5742 conflict review

**INDEPENDENT**

# The Independent Stream

- The Independent Stream publishes RFCs, but they are **not** IETF RFCs
  - Described in RFC 4846
- Independent Stream RFCs are never Standards Track
  - Informational or Experimental RFCs “Not rooted in the IETF standards process”
- Not intended to publish a large number of RFCs
  - Internet-related technologies that are not part of the IETF agenda
  - Discussions of technologies, options, or experience with protocols
  - Informational publication of vendor-specific protocols
    - Intended to allow interoperable implementation
  - Critiques and discussions of alternatives to IETF protocols
    - Important “safety valve”
- Overseen by the Independent Submissions Editor (ISE)
  - Review by volunteer reviewers (no consensus required)
    - Editorial Board (ISEB) and subject experts
  - IESG reviews per RFC 5742 and may request no publication or a delay
    - Prevent conflict with IETF work
    - ISE has final say
- April 1st



# Summary

- You want your draft to be clear and meaningful
- You want your draft to move forward quickly and smoothly
- You are responsible for making your draft high quality
  - Find and fix problems early
  - Ask for help
- Do not rely on the IESG or RFC Editor to catch and fix your problems
  - This can lead to errors
  - It may delay your work
  - It makes everyone unhappy

# Random Picture of a Relaxed Squirrel



# Feedback Please



Please help the Edu Team plan future tutorials

<https://www.surveymonkey.com/r/goodRFC>